TO:	Mr. Carl P. Garvey and Mr. M. Brendan Mullen (Revitalizing Auto Communities Environmental Response Trust) Mr. Alan J. Knauf and Ms. Linda R. Shaw (Knauf Shaw LLP)
FROM:	Katherine Lasseter, Jason Dittman, Jamie Combes, and Alice England (TIG Environmental) 443 North Franklin Street, Suite 220, Syracuse, NY 13204
SUBJECT:	**Evidence Summary Memorandum for Super Heat Treating**
DATE:	October 2, 2019

1. Introduction

Revitalizing Auto Communities Environmental Response (RACER) Trust and Knauf Shaw LLP (Knauf Shaw) contacted TIG Environmental[1] to provide consulting services regarding potentially responsible party (PRP) identification and investigation, sampling and data analysis, and expert witness testimony to support RACER Trust and Knauf Shaw during litigation proceedings stemming from a Civil Action No.: 5:18-cv-1267 [DNH/ATB] filed on October 26, 2018 (the Complaint) (RACER 2018).

In the Complaint, RACER Trust, by its attorneys, Knauf Shaw LLP, brings claims for cost recovery and contribution under Sections 107(a) and 113(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. 9607(a) and 9613(f), inter alia, against parties (Defendants) operating in or around the Ley Creek Watershed Site (Study Area) in Onondaga County, New York. The Complaint asserts that the Defendants are responsible to contribute to the cost of past and future investigations to address contamination in and around the Study Area.

The Study Area consists of the GM-Inland Fisher Guide Facility (GM-IFG) Sub-Site Operable Unit 1 (OU-1), the expanded OU-2 area (Ley Creek from Townline Road west to Route 11, including creek banks and limited floodplain and hotspot areas), and tributaries upstream of Townline Road bridge. As defined in the Record of Decision (ROD) for OU-2, the identified contaminants of concern (COCs) in the Study Area are polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), chromium, copper, lead, nickel, and zinc. PCBs are the predominant contaminants in Ley Creek sediments (NYSDEC and EPA 2015).

[1] TIG Environmental is a member of The Intelligence Group, LLC.

Evidence Summary Memorandum for Super Heat Treating

In this evidence summary memorandum (ESM), TIG Environmental reviewed evidence gathered by RACER Trust and Knauf Shaw to evaluate the following for each Defendant's site:

- Documented and suspected PCB usage at the Defendant's site
- The existence of PCB-containing electrical equipment or electrical substations (utility- or Defendant-owned) on the Defendant's site
- Whether pathways exist between the Defendant's site and the Ley Creek watershed (defined as Ley Creek and its tributaries)

Sections 2 through 4 summarize the available information on Defendant operations related, or potentially related, to PCB usage; detections of contaminants at or related to the Defendant site; permits, waste handling, spills, and/or releases at each Defendant's site; whether pathways from the Site to Ley Creek watershed can be determined; data gaps; and proposed sampling to address identified data gaps. Defendant information, site ownership information, and dates of operation for the Defendant's site are available in Knauf Shaw's site dossier (Knauf Shaw Super Heat Treating Site Dossier).

2. Description of Site Operations Related to PCBs

According to Knauf Shaw's Dossier for the Super Heat Treating Site (the Site), Roth Brothers, Inc. (Roth Brothers) owned the Site, located at 3605 ½ James Street in Syracuse, prior to 1953 (Knauf Shaw Super Heat Treating Site Dossier, 1). However, a review of aerial photographs indicates that the Site was undeveloped in 1951 (RACER 1951). Therefore, the extent of Roth Brothers' operations at the Super Heat Treating Site from 1951 to 1953 is unknown. TIG Environmental has prepared a separate memorandum for the Roth Brothers Site.

Beginning in 1953, Super Heat Treating, Inc. (Super Heat Treating) owned and operated the Site (Knauf Shaw Super Heat Treating Site Dossier, 1). A review of aerial photographs indicates that a single large building was constructed onsite around that time.[2] The building onsite was vacant by 1994 and Super Heat Treating dissolved as a corporation in 1998 (Knauf Shaw Super Heat Treating Site Dossier, 1–2). A review of aerial photographs indicates that the building onsite was demolished sometime between 1995 and 2003 (Google Earth 1995; Google Earth 2003).

In 2005, Jagar Enterprises, Inc. (Jagar) purchased the Site through an Onondaga County foreclosure sale (Knauf Shaw Super Heat Treating Site Dossier, 1). Jagar's operations include used car sales, snow plowing, and catering (Jagar Enterprises, Inc. 2019). A review of aerial photographs indicates that the Site currently contains one new building constructed sometime between 2006 and 2008 and south of Super Heat Treating's former building. The area formerly occupied by Super Heat Treating's building is currently covered with concrete and gravel (Google Earth 2006; Google Earth 2008; Google Earth 2019).

There is little information available regarding operations at the Site. A 1967 newspaper advertisement for Super Heat Treating lists the following operations: vacuum heat treating and brazing, atmosphere heat

[2] A 1951 aerial photograph shows the site as vacant. The next available photograph, from 1966, does show a building (RACER 1951; RACER 1966). While there is a large gap between available photographs, this is consistent with the statement in the dossier that the site was developed in 1953.

treating, tool and die hardening, metallurgical lab and testing facilities, and production facilities for carburizing, hardening, normalizing, stress relieving, and cold treating (Syracuse Herald-Journal 1967). Generally, heat treating refers to the heating and cooling processes that change the metallurgical structure of metal pieces and, therefore, changes the mechanical properties of the metal (EPA 1992, 20). Waste streams from these processes can include refractory material from heat treating, spent salt baths from case hardening, spent quenchants from quenching, spent abrasive material from descaling, solvents and abrasives from cleaning, and plating waste from masking (EPA 1992, 20).

Quenching Fluids

As of 1980, Super Heat Treating was classified as a large quantity generator of hazardous waste in New York state for ignitable and reactive waste (D001 and D003 waste, respectively) and for cyanide-containing quenching waste[3] (F010 and F012 waste) (Knauf Shaw Super Heat Treating Exhibit A, 3). Oil is one of the most commonly used quenching fluids in heat-treating processes[4] (EPA 1992, 25; Erickson and Kaley 2011, 14). Quenching fluids were not always composed of purpose-manufactured products. The purpose of a quenching fluid was to transfer heat from a hot metal component and the heat transfer properties of PCBs made it a desirable metal quenching oil (Mackenzie 2018, 1; EPA 1992, 23; Erickson and Kaley 2010, 2–3, 14). Some quenching oils may have been composed, at least partially, of waste PCB-containing oils (Mackenzie 2018, 6). As a consequence of quenching oils being from mixed and/or waste origins, the specific PCB Aroclors or congeners found in quenching oils are unknown. Super Heat Treating operated from 1953 through the 1990s, which overlaps with the period when PCBs were manufactured and used in non-enclosed products in the United States[5] (1929 through approximately 1984) (Erickson and Kaley 2011, 1). Thus, it is possible that PCB-containing quenching oils were used onsite.

Heat Treating Furnaces

PCBs have also been used in hydraulic systems that manage hot metals, such as heat treating furnaces (EPA 2004, 68). Hydraulic systems normally leak through connection joints and piston rings several times per year due to the high operating pressure of the system and could be a source of PCB leaks (EPA 2004, 68). Additionally, there are no site plans or equipment lists regarding the particular nature of furnaces used

[3] Quenching is a cooling process that requires immersing a hot metal piece in water, oil (mineral or paraffin-based), a polymer solution, or molten salt (EPA 1992, 23). According to 6 CRR-NY 371.4 (b), heat-treating processes where cyanides are used generate oil quenching bath residue waste (F010 waste code) and quenching wastewater treatment sludge waste (F012 waste code) (6 CRR-NY 371.4 [b]).

[4] Beginning in 1935, Swann Chemical Company, followed by the Monsanto Company, produced commercially available PCB-containing goods in a line of products known as “Aroclors.” Each of the 10 common PCB Aroclor mixtures are generally associated with certain signatures of PCB congeners (there are 209 PCB congeners) (Erickson and Kaley 2011, 2–3). The style of reporting analytical data for PCBs varies in reviewed documentation. Results may be reported as individual Aroclors and/or congeners, as a sum of all or some of these analytes, or simply as “PCBs.” For the purposes of this memorandum, TIG Environmental will state “total PCBs” when the source document has reported analytical results as either “PCBs” or “total PCBs.” This is presumed to represent the sum of PCB Aroclors or congeners. TIG Environmental reports PCB Aroclor- or congener-specific data where that information is available.

[5] On May 31, 1979, the manufacture of PCBs was banned from non-enclosed uses, effective July 2, 1979 (EPA 1979a). Although PCBs were banned for use in 1979, they did not immediately disappear and are still present throughout the environment in trace quantities. As a result of the EPA-authorized five-year phase-out period and the continued use of these banned materials (EPA 1979b), some non-enclosed sources may have continued to retain old PCB-containing material and use of enclosed sources such as transformers may have continued beyond 1984 (EPA 1976, 273; Erickson and Kaley 2011, 2–3).

at the Site. However, PCBs may be generated when using electric arc furnaces (EAFs), a common type of furnace used for heating metals (Wu et al. 2014, 1). Because the PCBs generated by an EAF are not intentionally produced, the specific PCB congeners associated with each particular furnace are unknown. Studies of PCBs generated by furnaces and incinerators have identified a wide range of PCB congeners (Dyke 1998, 15, 20–23, 27). However, inadvertent PCB generation correlates with polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/F) generation (for dioxin-like PCBs) and congeners inadvertently produced have a higher degree of chlorination[6] than other technical PCB mixtures (Jiang et al 2015, 6–7; Ba et al 2009, 4–5). In a 2015 evaluation of the presence of PCBs in ash generated in industrial thermal processes such as the heating of metal in furnaces, PCB-180 (heptachlorobiphenyl) was found to be a dominant congener after thermal processes, as well as the decachlorobiphenyl homolog (PCB-209) (Jiang et al 2015, 6).

Railroad Spurs

Railroad spurs run along the Site's boundary. From the 1940s to the mid-1980s, transformers were used on rail cars (Slater 1996, 21). PCB fluids and electrical equipment were used in railroad systems (USDOT 1984, 25) and resulting PCB contamination is an issue at railcar maintenance locations and transit yards (Slater 1996, 29). Equipment typically used in railroad systems includes railroad (on-board) transformers and capacitors (Slater 1996, 31). PCB Aroclors 1260 and 1254 are specifically associated with transformers (Erickson and Kaley 2011, 10).

2.1 Discharge Permits, Waste Handling, and/or Spills at the Site

2.1.1 Discharge Permits

No discharge permits are on record for the Site.

2.1.2 Waste Handling Related to PCBs

No specific waste records or manifests are available for the Site.

2.1.3 Spills Related to PCBs

Two spills have been reported at the Site (Knauf Shaw Super Heat Treating Exhibit B). A used petroleum oil spill was reported in 1993, although reviewed documents do not specify the amount, the notifier, or resulting cleanup activities. During a 1994 inspection, the New York State Department of Environmental Conservation (NYSDEC) noted spills from 55-gallon containers into the soil and reported a black oily substance inside a vacant building with an open side entrance (Knauf Shaw Super Heat Treating Exhibit B, 2). NYSDEC documented the black oily substance as unknown petroleum and provided no specifics regarding the amount spilled or cleanup actions taken (Knauf Shaw Super Heat Treating Site Dossier, 2). Based on available documentation, the contaminated areas have not been analyzed for the presence of PCBs.

Quenching fluid, which contains oil that may have contained PCBs, was used onsite (EPA 1992, 25; Erickson and Kaley 2011, 14). With no spill records available before 1993, TIG Environmental cannot confirm whether any spills occurred during the earlier operational period when PCBs were in peak usage.

[6] Higher PCB congener values correlates to greater numbers of chlorine atoms attached to biphenyl rings (Erickson and Kaley 2011, 3).

No sampling data for PCBs in fluid or soils onsite are available to confirm or refute the possibility of quenching oil spills.

2.2 PCB Discharges to Ley Creek or Tributaries

This section discusses the documented or potential discharge pathways of PCBs from the Site, with emphasis on discharges to Ley Creek or its tributaries.

2.2.1 Direct Discharge

No information is available to characterize potential direct discharges from the Site to Ley Creek or its tributaries. The nearest tributaries are South Branch Ley Creek (approximately 0.36 mile to the northeast of the Site) and Headson's Brook (approximately 0.15 mile to the southeast). Headson's Brook drains to South Branch Ley Creek.

2.2.2 Sanitary Sewer

A 1969 feasibility study for a joint industrial and municipal wastewater treatment plant identifies Super Heat Treating as a small industry that discharges sanitary wastewaters (approximately 130 gallons per day) to an onsite septic tank and not into the sanitary sewer system (FWPCA 1969, 27, 29). As of 1988 (the first available records), Super Heat Treating was discharging wastewaters to the Onondaga County sanitary sewer system (FOIL261146 at FOIL261208). The date that Super Heat Treating connected to the sanitary sewer system is unknown.

2.2.3 Storm Sewer

No information is available to characterize potential discharges from the Site to Ley Creek or its tributaries via storm sewer.

2.2.4 Runoff

No information is available to characterize potential discharges from the Site to Ley Creek or its tributaries via runoff.

2.2.5 Groundwater

No information is available to characterize potential discharges from the Site to Ley Creek or its tributaries via groundwater.

3. Data Gaps

TIG Environmental has identified the following data gaps that would increase the understanding of how PCBs were used onsite and/or released from the Site.

- General industry documentation links PCBs to heat-treating processes such as quenching and heat transferring fluids in furnaces. Little information is known about Super Heat Treating's specific operations related to these activities; therefore, the assessment of the most likely uses of PCBs onsite and associated discharge pathways is limited. Site plans, operational documentation, and waste records prior to 1980 would be necessary to further characterize PCB use onsite.

- No information is available regarding electricity generation to power site equipment. If transformers were present, they could be a source of PCBs, as PCBs were commonly used in transformers during the time period of Super Heat Treating's operations at the Site. No aerial photographs indicate an exterior transformer onsite; however, it is possible that one could have existed inside the former building. Site plans and records would be necessary to determine whether this potential PCB source existed.
- Site plans that provide information about stormwater and sanitary sewers or other drainage features are unavailable. This data gap limits the assessment of potential discharge pathways via stormwater and sanitary sewers, or other drainage features from the Site to South Branch Ley Creek or Headson's Brook.
- Site media have not been evaluated for contamination and, therefore, no information is available regarding current or historical presence of PCB contamination onsite.
    - Recommendation: Conduct additional soil sampling onsite for PCB analysis (Section 4.1).
- The location of Headson's Brook relative to the Site boundary is unknown. In order to choose appropriate sediment sampling locations in Headson's Brook, it is necessary to determine how far the channel extends to the northwest.
    - Recommendation: Perform site reconnaissance to fully characterize the location of Headson's Brook.

4. Proposed Sampling to Assess Contributions to the Study Area

Because of the data gaps identified in Section 3, TIG Environmental proposes additional sampling at the Site, as described in the sections below. TIG Environmental recommends that analyzing the sampling locations for PCB Aroclors (EPA Method 8082A), PCB congeners (EPA Method 1668C), total organic carbon (Lloyd Kahn method), grain size (ASTM D422), and total solids (ASTM D2216-98). In addition to those parameters, TIG Environmental may also propose sampling for particular contaminant classes (for example, metals, PAHs, volatile organic compounds [VOCs], and semivolatile organic compounds [SVOCs]), depending on the nature of operations surrounding a particular sampling location.

4.1 Soil

There is no record of soil characterization for the Site; therefore, TIG Environmental recommends soil sampling to analyze for PCBs. Additionally, because of past petroleum oil spills and the use of quenching fluids, TIG Environmental suggests analyzing for other contaminants, including VOCs and cyanides. As little is known about the groundwater, runoff, septic tank, or sanitary and sewer lines at the Site and how they are connected to South Branch Ley Creek or Headson's Brook, TIG Environmental currently recommends collecting a soil sample near the former primary Super Heat Treating building.

4.2 Sediments

No information is available for discharge pathways from the Site to South Branch Ley Creek or Headson's Brook (a tributary to South Branch Ley Creek), and the Site is not directly adjacent to South Branch Ley Creek. Sediments nearest to the Site (the shortest distance) are located in South Branch Ley Creek north of

the Oberdorfer Aluminum Site and Roth Brothers Site (both of which are evaluated in separate memorandums) and in Headson's Brook. Sampling locations in Headson's Brook will be chosen after onsite reconnaissance is performed to determine how close it flows to the site boundary (Section 3).

5. References

This ESM was prepared using the evidentiary materials listed below and provided with this document.

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